SEQUENCE LISTING

(1) GENERAL INFORMATION:

    (i) APPLICANT: Murphy, Brian R.
              Collins, Peter L.
              Whitehead, Stephen S.
              Bukreyev, Alexander A.
              Juhasz, Katalin

    (ii) TITLE OF INVENTION: PRODUCTION OF ATTENUATED RESPIRATORY
         SYNCYTIAL VIRUS VACCINES FROM CLONED NUCLEOTIDE SEQUENCES

    (iii) NUMBER OF SEQUENCES: 14

    (iv) CORRESPONDENCE ADDRESS:
        (A) ADDRESSEE: Townsend and Townsend and Crew LLP
        (B) STREET: Two Embarcadero Center, 8th Floor
        (C) CITY: San Francisco
        (D) STATE: CA
        (E) COUNTRY: USA
        (F) ZIP: 94111-3834

    (v) COMPUTER READABLE FORM:
        (A) MEDIUM TYPE: Floppy disk
        (B) COMPUTER: IBM PC compatible
        (C) OPERATING SYSTEM: PC-DOS/MS-DOS
        (D) SOFTWARE: PatentIn Release #1.0, Version #1.25

    (vi) CURRENT APPLICATION DATA:
        (A) APPLICATION NUMBER: US
        (B) FILING DATE: 15-JUL-1997
        (C) CLASSIFICATION:

    (vii) PRIOR APPLICATION DATA:
        (A) APPLICATION NUMBER: US 60/047,634
        (B) FILING DATE: 23-MAY-1997

    (vii) PRIOR APPLICATION DATA:
        (A) APPLICATION NUMBER: US 60/046,141
        (B) FILING DATE: 09-MAY-1997

    (vii) PRIOR APPLICATION DATA:
        (A) APPLICATION NUMBER: US 60/021,773
        (B) FILING DATE: 15-JUL-1996

    (viii) ATTORNEY/AGENT INFORMATION:
        (A) NAME: Parmelee, Steven W.
        (B) REGISTRATION NUMBER: 31,990
        (C) REFERENCE/DOCKET NUMBER: 17634-000510

    (ix) TELECOMMUNICATION INFORMATION:
        (A) TELEPHONE: 206-467-9600
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(2) INFORMATION FOR SEQ ID NO:1:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 15223 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:1:

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AACTAAATTA CGAGATATTA GTTTTTGACA CTTTTTTTCT CGT                      15223
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(2) INFORMATION FOR SEQ ID NO:2:

    (i) SEQUENCE CHARACTERISTICS:
       (A) LENGTH: 15225 base pairs
       (B) TYPE: nucleic acid
       (C) STRANDEDNESS: single
       (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: cDNA

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:2:

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TGATAAAGGT TAGATTACAA AATTTATTTG ACAATGACGA AGTAGCATTG TTAAAAATAA     180

CATGTTATAC TGACAAATTA ATTCTTCTGA CCAATGCATT AGCCAAAGCA GCAATACATA     240

CAATTAAATT AAACGGTATA GTTTTTATAC ATGTTATAAC AAGCAGTGAA GTGTGCCCTG     300

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CCCAACCAAA CCAAGCTATT CCTCAAACAA CAATGCTCAA TAGTTAAGAA GGAGCTAATC    1080
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ACCACCTCAA CACAGACCAA CAAGCCGAGC ACAAAACCAC GCCTAAAAAA TCCACCAAAA    5160

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AAATCCATAA CTAATATACT TGAAAAAACA TCAGCAATAG ATACAACTGA TATTAATAGG   12000

GCTACTGATA TGATGAGGAA AAATATAACT TTACTTATAA GGATACTTCC ACTAGATTGT   12060

AACAAAGACA AAAGAGAGTT ATTAAGTTTA GAAAATCTTA GTATAACTGA ATTAAGCAAG   12120

TATGTAAGAG AAAGATCTTG GTCATTATCC AATATAGTAG GAGTAACATC GCCAAGTATT   12180

ATGTTCACAA TGGACATTAA ATATACAACT AGCACTATAG CCAGTGGTAT AATTATAGAA   12240

AAATATAATG TTAATAGTTT AACTCGTGGT GAAAGAGGAC CTACTAAGCC ATGGGTAGGT   12300

TCATCTACGC AGGAGAAAAA AACAATGCCA GTGTACAATA GACAAGTTTT AACCAAAAAG   12360

CAAAGAGACC AAATAGATTT ATTAGCAAAA TTAGACTGGG TATATGCATC CATAGACAAC   12420

AAAGATGAAT TCATGGAAGA ACTGAGTACT GGAACACTTG GACTGTCATA TGAAAAAGCC   12480

AAAAAGTTGT TTCCACAATA TCTAAGTGTC AATTATTTAC ACCGTTTAAC AGTCAGTAGT   12540

AGACCATGTG AATTCCCTGC ATCAATACCA GCTTATAGAA CAACAAATTA TCATTTCGAT   12600

ACTAGTCCTA TCAATCATGT ATTAACAGAA AAGTATGGAG ATGAAGATAT CGACATTGTG   12660

TTTCAAAATT GCATAAGTTT TGGTCTTAGC CTGATGTCGG TTGTGGAACA ATTCACAAAC   12720

ATATGTCCTA ATAGAATTAT TCTCATACCG AAGCTGAATG AGATACATTT GATGAAACCT   12780

CCTATATTTA CAGGAGATGT TGATATCATC AAGTTGAAGC AAGTGATACA AAAACAGCAT   12840

ATGTTCCTAC CAGATAAAAT AAGTTTAACC CAATATGTAG AATTATTCCT AAGTAACAAA   12900

GCACTTAAAT CTGGATCTAA CATCAATTCT AATTTAATAT TAGTACATAA AATGTCTGAT   12960

TATTTTCATA ATGCTTATAT TTTAAGTACT AATTTAGCTG ACATTGGAT TCTAATTATT   13020

CAACTTATGA AAGATTCAAA AGGTATTTTT GAAAAAGATT GGGGAGAGGG GTACATAACT   13080

GATCATATGT TCATTAATTT GAATGTTTTC TTTAATGCTT ATAAGACTTA TTTGCTATGT   13140

TTTCATAAAG GTTATGGTAA AGCAAAATTA GAATGTGATA TGAACACTTC AGATCTTCTT   13200

TGTGTTTTGG AGTTAATAGA CAGTAGCTAC TGGAAATCTA TGTCTAAAGT TTTCCTAGAA   13260

CAAAAAGTCA TAAAATACAT AGTCAATCAA GACACAAGTT TGCATAGAAT AAAAGGCTGT   13320

CACAGTTTTA AGTTGTGGTT TTTAAAACGC CTTAATAATG CTAAATTTAC CGTATGCCCT   13380

TGGGTTGTTA ACATAGATTA TCACCCAACA CATATGAAAG CTATATTATC TTACATAGAT   13440

TTAGTTAGAA TGGGGTTAAT AAATGTAGAT AAATTAACCA TTAAAAATAA AAACAAATTC   13500

AATGATGAAT TTTACACATC AAATCTCTTT ACATTAGTT ATAACTTTTC AGACAACACT   13560

CATTTGCTAA CAAAACAAAT AAGAATTGCT AATTCAGAAT TAGAAGATAA TTATAACAAA   13620

CTATATCACC CAACCCCAGA AACTTTAGAA AATATATCAT TAATTCCTGT TAAAAGTAAT   13680
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AATAGTAACA AACCTAAATT TTGTATAAGT GGAAATACCG AATCTATAAT GATGTCAACA    13740

TTCTCTAATA AAATGCATAT TAAATCTTCC ACTGTTACCA CAAGATTCAA TTATAGCAAA    13800

CAAGACTTGT ACAATTTATT TCCAAATGTT GTGATAGACA GGATTATAGA TCATTCAGGT    13860

AATACAGCAA AATCTAACCA ACTTTACATC ACCACTTCAC ATCAGACATC TTTAGTAAGG    13920

AATAGTGCAT CACTTTATTG CATGCTTCCT TGGCATCATG TCAATAGATT TAACTTTGTA    13980

TTTAGTTCCA CAGGATGCAA GATCAGTATA GAGTATATTT TAAAAGATCT TAAGATTAAG    14040

GACCCCAGTT GTATAGCATT CATAGGTGAA GGAGCTGGTA ACTTATTATT ACGTACGGTA    14100

GTAGAACTTC ATCCAGACAT AAGATACATT TACAGAAGTT TAAAAGATTG CAATGATCAT    14160

AGTTTACCTA TTGAATTTCT AAGATTATAC AACGGGCATA TAAACATAGA TTATGGTGAG    14220

AATTTAACCA TTCCTGCTAC AGATGCAACT AATAACATTC ATTGGTCTTA TTTACATATA    14280

AAATTTGCAG AACCTATTAG CATCTTTGTC TGCGATGCTG AATTACCTGT TACAGCCAAT    14340

TGGAGTAAAA TTATAATTGA ATGGAGTAAG CATGTAAGAA AGTGCAAGTA CTGTTCTTCT    14400

GTAAATAGAT GCATTTTAAT CGCAAAATAT CATGCTCAAG ATGATATTGA TTTCAAATTA    14460

GATAACATTA CTATATTAAA AACTTACGTG TGCCTAGGTA GCAAGTTAAA AGGATCTGAA    14520

GTTTACTTAG TCCTTACAAT AGGCCCTGCA AATATACTTC CTGTTTTTGA TGTTGTGCAA    14580

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GAATCTATCG ATGCAAATAT TAAAAGCTTA ATACCTTTCC TTTGTTACCC TATAACAAAA    14700

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TATTCTATAG CTGGACGTAA TGAAGTATTC AGCAACAAGC TTATAAACCA CAAGCATATG    14820

AATATCCTAA AATGGCTAGA TCATGTTTTA AATTTTAGAT CAGCTGAACT TAATTACAAT    14880

CATTTATACA TGATAGAGTC CACATATCCT TACTTAAGTG AATTGTTAAA TAGTTTAACA    14940

ACCAATGAGC TCAAGAAACT GATTAAAATA ACAGGTAGTG TACTATACAA CCTTCCCAAC    15000

GAACAGTAAC TTAAAATATC ATTAACAAGT TTGGTCAAAT TTAGATGCTA ACACATCATT    15060

ATATTATAGT TATTAAAAAA TATGCAAACT TTTCAATAAT TTAGCTTACT GATTCCAAAA    15120

TTATCATTTT ATTTTTAAGG GGTTGAATAA AAGTCTAAAA CTAACAATGA TACATGTGCA    15180

TTTACAACAC AACGAGACAT TAGTTTTTGA CACTTTTTTT CTCGT                    15225
```

(2) INFORMATION FOR SEQ ID NO:3:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 33 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: cDNA

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:3:

ACTCAAATAA GTTAATAAAA AATATCCCGG GAT   33

(2) INFORMATION FOR SEQ ID NO:4:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 31 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: cDNA

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:4:

CCCGGGATAT TTTTTATTAA CTTATTTGAG T   31

(2) INFORMATION FOR SEQ ID NO:5:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 18 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: cDNA

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:5:

GAAAGTATAT ATTATGTT   18

(2) INFORMATION FOR SEQ ID NO:6:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 20 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: cDNA

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:6:

TATATAAGCA CGATGATATG   20

(2) INFORMATION FOR SEQ ID NO:7:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 16 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: cDNA

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:7:

ACTCAAATAA GTTAAT   16

(2) INFORMATION FOR SEQ ID NO:8:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 14 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: cDNA

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:8:

TAACTTATTT GAGT   14

(2) INFORMATION FOR SEQ ID NO:9:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 28 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: cDNA

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:9:

GACACAACCC ACAATGATAA TACACCAC   28

(2) INFORMATION FOR SEQ ID NO:10:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 32 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: cDNA

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:10:

CATCTCTAAC CAAGGGAGTT AAATTTAAGT GG   32

(2) INFORMATION FOR SEQ ID NO:11:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 27 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: cDNA

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:11:

TTAAGGAGAG ATATAAGATA GAAGATG   27

(2) INFORMATION FOR SEQ ID NO:12:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 27 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: cDNA

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:12:

GTTTTATATT AACTAATGGT GTTAGTG   27

(2) INFORMATION FOR SEQ ID NO:13:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 33 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: cDNA

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:13:

TTATAATTGC AGCCATCATA TTCATAGCCT CGG   33

(2) INFORMATION FOR SEQ ID NO:14:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 30 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: cDNA

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:14:

GTGAAGTTGA GATTACAATT GCCAGAATGG   30